

Message Text

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ACDA: MR. OYSTER

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T/D - MR. MCGAFFIGAN

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TO AMEMBASSY PARIS

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TAGS: TECH, IAEA, FR

SUBJECT: ANNOUNCEMENT AT IAEA SALZBURG CONFERENCE BY FRANCE
OF NEW URANIUM ENRICHMENT PROCESS

1. FOLLOWING IS REPORT BY USDEL RE SUBJECT ANNOUNCE-

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MENT: SUMMARY: SUBJECT ANNOUNCEMENT, RUMORED FOR SEVERAL
DAYS AT SALZBURG, WAS MADE BY CEA HEAD GIRAUD DURING
PRESENTATION OF HIS SCHEDULED PAPER DURING PLENARY SESSION
FRIDAY, AM, MAY 6, FOLLOWED BY PRESS CONFERENCE BY GIRAUD,
ACCOMPANIED BY FREJACQUES AND COATES THAT AFTERNOON. NO
TECHNICAL DETAILS OF PROCESS, DESCRIBED ONLY AS CHEMICAL
"EXCHANGE" OR "TREATMENT", WERE PROVIDED, DESPITE REPEATED
REQUESTS DURING BOTH PLENARY QUESTION PERIOD AND PRESS
CONFERENCE. IN ABSENCE OF DETAILS, FRENCH CLAIM THAT
PROCESS IS "PROLIFERATION PROOF" (AND THUS NOT REPEAT NOT

"SENSITIVE TECHNOLOGY") MUST BE VIEWED WITH SKEPTICISM.
INTENT OF FRENCH ANNOUNCEMENT IS CLEARLY TO OPEN DISCUSSION
AND HOPEFULLY OBTAIN CONFIRMATION BY OTHER GOVERNMENTS,
ESPECIALLY THOSE DEDICATED TO NON-PROLIFERATION, OF
"PROLIFERATION-PROOF" CHARACTER OF PROCESS AND CONCURRENCE
IN MAKING PROCESS AVAILABLE, IN DUE COURSE, TO NNWS'S.
END SUMMARY.

2. FIRST INDICATION THAT FRANCE WOULD BE ANNOUNCING
SUCCESSFUL DEVELOPMENT OF NEW URANIUM ENRICHMENT PROCESS
WAS REPORT BY MEMBERS OF IAEA SECRETARIAT LATE DURING
OPENING DAY OF CONFERENCE THAT SUCH REVELATION WOULD BE
MADE BY C. FREJAQUES ET AL, OF CEA, IN PRESENTATION
SCHEDULED FOR NEXT DAY, MAY 3, DURING TECHNICAL SESSION.
FREJACQUES PRESENTATION, HOWEVER, MERELY INCLUDED ONE-PAGE
DISCUSSION OF CHEMICAL EXCHANGE TECHNIQUE AMONG VARIOUS
TECHNIQUES STUDIED IN FRANCE: GASEOUS DIFFUSION, GAS
CENTRIFUGE, AERODYNAMIC METHODS SUCH AS "JET MEMBRANE"
AND SONICS, CHEMICAL EXCHANGE, PHOTOCHEMICAL EXCITATION,
IONIC AND ELECTROMAGNETIC, IN THAT ORDER. DESCRIPTION OF
CHEMICAL EXCHANGE PROCESS GIVEN IN PAPER (IAEA-CN-36/FR/
257, COPY HAND-CARRIED BY P. VANSTRUM, UNION CARBIDE, OAK
RIDGE) IS IN GENERAL TERMS AND REFERS TO STUDIES IN FRANCE
PRINCIPALLY RELATED TO EXCHANGE BETWEEN PHASES CONTAINING
URANIUM OF DIFFERENT VALENCES. PAPER MENTIONS THAT
CHEMICAL EXCHANGE PROCESSES ARE CHARACTERIZED BY LESS
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SOPHISTICATED TECHNOLOGY THAN OTHER METHODS AND ARE EASILY
INDUSTRIALIZED ON LARGE SCALE. PROCESS CONSUMES ENERGY
NOTABLY IN CIRCULATION AND MIXING OF PHASES AND IN
REFLUXING, MOST OFTEN BY ELECTROCHEMICAL MEANS. PROCESS
IS HANDICAPPED BY SUBSTANTIAL URANIUM INVENTORY IN
EQUIPMENT. MOST IMPORTANT FACTORS ARE EQUILIBRIUM TIME AND
ENERGY REQUIRED FOR REFLUX. DATA IN TABLE IN PAPER
COMPARES LIQUID-LIQUID U-IV/U-VI EXCHANGE, GAS-LIQUID
U-V/U-VI EXCHANGE AND SYSTEM USING RESINS FOR U-IV/U-VI
EXCHANGE, GIVING EQUILIBRIUM TIMES PER STAGE OF 2 TO 3
MINUTES, 30 TO 40 SECONDS AND 40 TO 60 SECONDS
RESPECTIVELY. REFLUX IS CHARACTERIZED AS "EASY,"
"DIFFICULT," AND "POSSIBLE" RESPECTIVELY. PAPER STATES THAT
A NEW PROCESS UTILIZING "DES COMPOSES COURONNES" OF
URANIUM IS ACTUALLY UNDER STUDY. COMMENT: DEL UNABLE
TRANSLATE TECHNICAL SIGNIFICANCE QUOTED PHRASE. END
COMMENT. METHOD SUMMARIZED IN PAPER BY NOTING THAT IT IS
VERY ATTRACTIVE FROM THE POINT OF VIEW OF DISSEMINATION
IN THAT PROBLEMS OF CRITICALITY IN LIQUID PHASES, WILL NOT
PERMIT THE LARGE COLUMNS USED FOR PRODUCTION OF 3 PER CENT
U-235, TO BE USED FOR PRODUCTION OF HIGHLY ENRICHED
URANIUM. MOREOVER, EQUILIBRIUM TIME NECESSARY TO REACH
90 PER CENT IS PROHIBITIVE, WHILE THAT FOR 3 PER CENT

WILL PROBABLY BE VERY ACCEPTABLE. DATA IN PAPER GIVE EQUILIBRIUM TIMES AS SHORT AS 1.1 YEAR FOR 3 PER CENT AND "MORE THAN TEN YEARS" FOR 90 PER CENT. COMMENT: IT IS UNCLEAR WHETHER REFERENCE IS TO SAME EQUIPMENT IN EACH CASE, WHEN REFERRING TO EQUILIBRIUM TIMES, BUT REFERENCE NOTED ABOVE TO CRITICALITY PROBLEMS CLEARLY REFER TO

SAME EQUIPMENT FOR BOTH 3 PERCENT AND 90 PERCENT.
END COMMENT. PAPER CONCLUDES WITH STATEMENT THAT CENTRIFUGE, LASER, AERODYNAMIC PROCESSES AND CHEMICAL EXCHANGE METHODS WILL PROBABLY BE SERIOUS COMPETITORS TO GASEOUS DIFFUSION DURING THE NEXT DECADE. FROM POINT OF VIEW OF DISSEMINATION, CHEMICAL EXCHANGE PROCESSES CAN GIVE LIMITED OFFICIAL USE
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A SATISFACTORY SOLUTION TO COUNTRIES DESIRING INDEPENDENCE IN SUPPLY OF NUCLEAR FUEL, WHILE GAS CENTRIFUGE AND LASER TECHNIQUES, ON THE OTHER HAND, POSE SERIOUS PROBLEMS.

3. AT THE END OF HIS SCHEDULED PRESENTATION IN PLENARY FRIDAY A.M. MAY 6 (ENTITLED: THE NUCLEAR FUEL CYCLE: ENCOURAGING AND LESS ENCOURAGING ASPECTS") A. GIRAUD ANNOUNCED THAT, IN COURSE OF TEN YEARS OF STUDY IN FRENCH LABORATORIES, PROCESS BASED UPON CHEMICAL EXCHANGE HAD BEEN DEVELOPED TO STAGE WHERE DEMONSTRATION PLANT OF FIFTY STAGES WAS PLANNED. PROCESS, WHILE APPEARING GOOD CANDIDATE FOR PRODUCTION OF LOW-ENRICHED URANIUM WAS UNSUITABLE FOR HIGHLY-ENRICHED URANIUM BECAUSE OF THREE CHARACTERISTICS:

(A) PROCESS CASCADE OPERATES IN SERIES SUCH THAT IT IS DIFFICULT, IF NOT IMPOSSIBLE, TO REARRANGE PIPING IN ORDER TO ACHIEVE HIGH ENRICHMENT;

(B) PROCESS UTILIZES LIQUID PHASE AND THUS CRITICALITY CONSIDERATIONS PREVENT USE OF EQUIPMENT FOR HIGH ENRICHMENT; AND

(C) WHEREAS EQUILIBRIUM TIME FOR 3 PERCENT IS "COMPATIBLE" WITH CONSTRUCTION TIME, TIME TO REACH EQUILIBRIUM FOR 90 PERCENT URANIUM IS THIRTY YEARS.

FRANCE WAS OPEN TO INTERNATIONAL PARTICIPATION IN MOVING TO DEMONSTRATION PLANT FOR PROCESS WHICH APPEARS TO BE WITHIN COMPETITIVE RANGE WITH GASEOUS DIFFUSION, ALTHOUGH POSSIBLE OPTIMISTIC ECONOMICS WILL NEED TO BE CONFIRMED. DURING QUESTION PERIOD, GIRAUD RESPONDED BY NOTING THAT EXPRESSIONS OF INTEREST BY GOVERNMENTS WERE BEING SOLICITED SINCE RESPONSIBILITY FOR MAKING PROCESS TECHNOLOGY AVAILABLE GENERALLY IS MORE THAN FRANCE CAN CARRY

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ALONE. RISK OF PROLIFERATION IN SPENT FUEL REPROCESSING
IS LESS THAN THAT OF PRODUCTION OF HIGHLY ENRICHED
URANIUM. IF NEW FRENCH PROCESS IS SHOWN TO HAVE APPARENT
CHARACTERISTICS, TECHNOLOGY WILL NOT REPEAT NOT BE

"SENSITIVE". LIMITED INFORMATION, SUCH AS PRESENTED
AT CONFERENCE, HAD ALREADY BEEN GIVEN TO EURODIF PARTNERS.
NUCLEAR ENERGY IS NECESSARY FOR THE WORLD AND PROCESS
GIVES OPPORTUNITY TO COUNTRIES TO PROVIDE THEIR OWN
FUEL WITHOUT RISK OF PROLIFERATION. PROCESS REQUIRES
ONE-THIRD OF ELECTRIC POWER REQUIRED FOR GASEOUS
DIFFUSION, BUT WILL PROBABLY NOT COMPETE WITH LATTER
AT LEAST INITIALLY, ALTHOUGH POTENTIAL FOR IMPROVEMENT
IS THERE. STATUS OF DEVELOPMENT OF TECHNOLOGY IS
COMPARABLE TO CENTRIFUGE AT PRESENT. MOREOVER, PROCESS
EQUIPMENT IS SIMPLER THAN GASEOUS DIFFUSION AND INCURS
NO PENALTY OF SCALE. CONSTRUCTION OF DEMONSTRATION
PLANT PLANNED TO BEGIN IN L979, TO BE UNDERTAKEN BY
FRANCE ALONG OR WITH "COOPERATION" OF OTHER GOVERNMENTS
WITH DECISION REGARDING COMMERCIALIZATION FORESEEN
ONLY IN LATE 1980'S.

4. AT PRESS CONFERENCE MID-AFTERNOON SAME DAY, RELEASE,
IN BOTH FRENCH AND ENGLISH TEXTS, WAS HANDED OUT TO
SRO CROWD. (ENGLISH TEXT TRANSMITTED SEPTEL). QUESTIONS
SIMILAR TO THOSE ASKED IN PLENARY WERE REPEATED, THIS
TIME BY REPORTERS. GIRAUD RESPONDED WITH GRACE AND
CHARM, STILL REFUSING TO GIVE ANY TECHNICAL DETAILS.
HE STATED REASON FOR ANNOUNCEMENT WAS TO OFFER ENRICH-
MENT PROCESS, IN LIGHT NECESSITY FOR NUCLEAR POWER,
WHICH WAS COMPATIBLE WITH GOF CONCERN RE PROLIFERATION.
REACTION FROM OTHER GOVERNMENTS WAS WANTED BEFORE
TECHNICAL DETAILS WERE REVEALED, IN LIGHT GREAT
RESPONSIBILITY. DEMONSTRATION PLANT WITH SEPARATION
CAPACITY OF 50 TO 200 TONS. PROCESS WAS NOT UNDER
CONSIDERATION BY EURODIF OR COREDIF, SINCE TIME FOR
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DECISION THOSE ENTERPRISES WILL NOT PERMIT ECONOMICS
OF NEW PROCESS TO BE CONFIRMED. THUS, GASEOUS DIFFUSION
REMAINS MOST ECONOMIC PROCESS AT PRESENT. IN RESPONSE
TO QUESTION AS TO WHETHER TECHNOLOGY OF NEW PROCESS
WOULD BE EXPORTED, GIRAUD SAID TECHNOLOGY WOULD NOT BE
"SENSITIVE" AND THUS EXPORTED NOT PRECLUDED. OTHER
QUESTIONS PROVOKED RESPONSES THAT FRANCE HAS STUDIED
AND CONTINUING SMALL EFFORT ON CENTRIFUGE PROCESS BUT

CANNOT AFFORD DEMONSTRATION PLANT AND MORE EFFORT DURING
PAST TEN YEARS HAS BEEN DEVOTED TO CHEMICAL EXCHANGE
PROCESS. QUESTIONS RE LOCATION OF PILOT PLANTS BROUGHT

RESPONSE THAT TECHNIQUE IS "DELICATE" SO LOCATION WOULD
NOT BE GIVEN. TWO TYPES OF PILOT PLANTS HAVE BEEN
OPERATED, IN L975 AND L976 AT GREATER THAN 90 PERCENT
AVAILABILITY. IN ONE TYPE, A NUMBER OF SMALL STAGES
HAVE BEEN OPERATED IN CASCADE IN ORDER TO VERIFY
PRINCIPLE INVOLVED. IN OTHERS, SINGLE LARGER STAGES
HAVE BEEN OPERATED TO STUDY TECHNOLOGY. SIX OR SEVEN
DIFFERENT CHEMICAL EXCHANGE SYSTEMS HAVE BEEN STUDIED.
PROBLEMS ARE NOT RELATED TO TECHNICAL DETAILS.

5. U.S. DELEGATION SUGGESTS THAT "PROLIFERATION-
PROOF" CHARACTERISTICS BE VIEWED WITH SKEPTICISM AT
MOMENT. IT IS NOT CLEAR WHY PROCESS TECHNOLOGY INVOLVED
COULD NOT BE APPLIED IN DESIGN OF PLANT UTILIZING SMALLER,
SPECIALY DESIGNED EQUIPMENT SUITABLE FROM CRITICALITY
STANDPOINT AND INVENTORY (WHICH IS PRINCIPAL FACTOR IN
EQUILIBRIUM TIME) TO PRODUCTION OF HIGHLY ENRICHED
URANIUM. RELATIVELY FEW TECHNICAL DETAILS WOULD PERMIT
EVALUATION OF PROCESS IN THAT REGARD. THOSE SAME
DETAILS WOULD ALSO PERMIT PRELIMINARY ESTIMATE
OF ECONOMICS OF PROCESS. CHRISTOPHER

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